

REMARKS

Claim 7 has been amended. Claims 1, 3-7 and 9-11 are pending and under consideration. Claims 1, 6 and 7 are the independent claims. No new matter is presented in this Amendment.

REJECTIONS UNDER 35 U.S.C. §102:

Claims 6, 7 and 9-11 are rejected under 35 U.S.C. §102(b) as being anticipated by Oka et al. (U.S. Patent No. 6,184,541).

Applicants traverse the rejection of claims 6, 7 and 9-11 for at least the following reasons.

Regarding the rejection of independent claim 6, it is noted that claim 6 recites:

A thin film transistor (TFT) comprising:

a channel region;

source and drain regions respectively formed at opposite sides of the channel region;

lightly doped drain (LDD) or offset regions formed at respective opposite sides of the channel region and between the source and drain regions; and

a plurality of primary crystal grain boundaries, wherein the thin film transistor is formed so that the primary crystal grain boundaries of a polysilicon substrate are positioned in the channel, source and drain regions but not positioned in the LDD or offset regions, and wherein a width of the LDD or offset regions is less than a distance between two adjoining primary crystal grain boundaries.

The Office Action relies on Oka for a teaching of the features of independent claim 6 and in particular, at page 2 of the Final Office Action dated December 2, 2010, states that Oka teaches lightly doped drain (LDD) or offset regions (portions of regions 4 having a width d in Fig. 1(b)) formed at respective opposite sides (left and right sides) of the channel region (8) and between the source and drain regions (5). Applicants respectfully disagree with these assertions.

Applicants respectfully submit that the teachings of Oka differ from the feature recited in

independent claim 6 for at least the following reason.

First, the Office Action states that portions of regions 4 having a width d illustrated in Fig. 1(b) are formed at respective opposite sides of the channel region and between the source and drain regions (5). Applicants respectfully direct the Examiner's attention to Figs. 1(a) and 1(b) and column 1, lines 26-32, and column 3, lines 37-43, which clearly state that the source 6 and the drain 7, each have an LDD structure that has a low concentration region 4 and a high concentration region 5. Thus, it is clear from the teachings of Oka, that the source region 6 includes two regions, a high concentration region 5 and a low concentration region 4, and that the drain region 7 also includes two regions, a high concentration region 5 and a low concentration region 4. That is, the high concentration region 5 is not by itself a source and drain region as suggested by the Examiner. Hence one of ordinary skill in the art would not arbitrarily interpret the high concentration region 5 as a source or drain region, as doing so would clearly be contrary to the teachings of Oka.

Furthermore, the LDD region (portions of region 4 having a width d in Fig. 1b) is part of the source region 6 or drain region 7, and therefore cannot be between the source and drain regions. Thus, nowhere in Oka is it taught or suggested "lightly doped drain (LDD) or offset regions formed at respective opposite sides of the channel region and between the source and drain regions," since the LDD region is part of the source and drain regions. Accordingly, Applicants respectfully request the Examiner to clearly evidence such teaching in Oka or withdraw the rejection under 35 U.S.C. §102.

Regarding the rejection of independent claim 7, it is noted that claim 7 recites:

A flat panel display device comprising:
 a thin film transistor comprising:
 a channel region;
 offset regions, each including inner and outer sides, formed at opposite sides of the channel region, wherein the inner sides of the offset regions directly contact the channel region;
source and drain regions respectively formed at outer sides of the offset regions; and
 a plurality of primary crystal grain boundaries,
 wherein the thin film transistor is formed so that the primary crystal grain boundaries of a polysilicon substrate are not positioned in the offset regions, and wherein a width of the offset regions, is

smaller than a distance between the primary crystal grain boundaries.

The Office Action relies on Oka for a teaching of the features of independent claim 7, and in particular, at page 3 of the Final Office Action dated December 2, 2010, states that Oka teaches offset regions (portions of regions 4 having a width d in Fig. 1(b)) formed at opposite sides (left and right sides) of the channel region (8). The Office Action further states that Oka teaches that the source and drain regions (5) are respectively formed at outer sides of the offset regions. Applicants respectfully disagree with these assertions.

Applicants respectfully submit that the teachings of Oka differ from the feature recited in independent claim 7 for at least the following reason.

As noted above, Figs. 1(a) and 1(b) and column 1, lines 26-32, and column 3, lines 37-43 of Oka, clearly state that each of the source region 6 and the drain region 7 have an LDD structure (offset region) that has a low concentration region 4 and a high concentration region 5. Thus, it is clear from the teachings of Oka, that the high concentration region 5 is not a drain or source by itself but is simply part of the source and drain regions. Hence one of ordinary skill in the art would not arbitrarily interpret the high concentration region 5 as a source or drain region, as doing so would clearly be contrary to the teachings of Oka.

Furthermore, the LDD structure (offset region, portion of region 4 having a width d) is also part of the source region 6 and drain region 7. Therefore, since the offset region and the high concentration region are part of the source and drain regions, it is not possible for the source and drain regions (5) to be formed at outer sides of the offset regions. Accordingly, Applicants respectfully request the Examiner to clearly evidence such teaching in Oka or withdraw the rejection under 35 U.S.C. §102.

Regarding the rejection of claims 9-11, it is noted that these claims depend from independent claim 7, and as noted above, Oka fails to teach or suggest the novel features of independent claim 7.

Accordingly, Applicants respectfully assert that the rejection of dependent claims 9-11 under 35 U.S.C. §102(b) should be withdrawn, at least, because of their dependency from claim 7, and the reasons set forth above, and because the dependent claims include additional features which are not taught or suggested by the prior art. Therefore, it is respectfully

submitted that claims 9-11 also distinguish over the prior art.

REJECTIONS UNDER 35 U.S.C. §103:

Claims 1 and 3-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Oka et al. (U.S. Patent No. 6,184,541).

Regarding the rejection of independent claim 1, it is noted that claim 1 recites:

A thin film transistor (TFT) comprising:
a channel region having a plurality of primary crystal grain boundaries;
source and drain regions formed at respective ends of the channel region; and
offset regions one of which is formed between the channel region and the source region and the other one of which is formed between the channel region and the drain region,
wherein the thin film transistor is formed so that the primary crystal grain boundaries of a polysilicon substrate are not positioned in the offset regions, and
wherein a width of each one of the offset regions is smaller than a distance between the primary crystal grain boundaries formed in the channel region.

The Office Action relies on Oka for a teaching of the features of independent claim 1. In particular, at page 5 of the Final Office Action dated December 2, 2010, the Examiner states that Oka teaches offset regions (portions of regions 4 having a width d in Fig. 1(b)) formed between the channel region (8) and the source region (5) and formed between the channel region (8) and the drain region (5). That is, the Examiner relies on element 5 for a teaching of source and drain regions.

Applicants respectfully submit that the teachings of Oka differ from the feature recited in independent claim 1 for at least the following reason.

As noted in Figs. 1(a) and 1(b) and column 1, lines 26-32, and column 3, lines 37-43 of Oka, the reference teaches that each source region 6 and drain region 7 has an LDD structure (offset region) and that this LDD structure has a low concentration region 4 and a high concentration region 5. Thus, it is clear from the teachings of Oka, that element 5 is part of the

source region 6 and part of the drain region 7. That is, there is nothing in between the channel region and the source and drain regions for as illustrated in Figs. 1(a) and 1(b) the source 6 and drain 7 regions directly contact the channel region 8.

Furthermore, the LDD structure (offset region, portion of region 4 having a width d) is also part of the source region 6 and part of the drain region 7. There is no teaching or suggestion in Oka that the portion of region 4 having a width d is not part of the source and drain region. Therefore, since the offset region (portion of region 4 having a width d) and the high concentration region are part of the source 6 and drain 7 regions, it is not possible for one of the offset regions to be formed between the channel region and the source region and the other one of the offset regions to be formed between the channel region and the drain region. Accordingly, one of ordinary skill in the art would not arbitrarily interpret the high concentration region 5 as source and drain regions, as doing so would clearly be contrary to the teachings of Oka.

Hence, Applicants respectfully submit that in making the assertions discussed above, the Office Action has failed to establish a prima facie case of obviousness.

Regarding the rejection of claims 3-5, it is noted that these claims depend from independent claim 1, and as noted above, Oka fails to teach or suggest the novel features of independent claim 1.

Accordingly, Applicants respectfully assert that the rejection of dependent claims 3-5 under 35 U.S.C. §103(a) should be withdrawn, at least, because of their dependency from claim 1.

CONCLUSION:

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 503333.

Respectfully submitted,

STEIN MCEWEN, LLP

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2/2/11

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